



Energy Efficiency and Renewables

- Goal of the three agency *Energy Action Plan* is to ensure adequate, reliable and reasonably-priced electrical power and natural gas supplies.
- *Action Plan* envisions a loading order of resources:
 - First, optimize strategies for energy conservation and efficiency
 - Second, meet new generation with renewable resources and distributed generation
 - Third, support additional clean, fossil fuel central power stations



Energy Efficiency Standards

- Energy Commission develops and implements efficiency standards for buildings and for appliances
- Standards began in mid 1970s
- Appliance standards require gas-fired appliances to be of a minimum efficiency
- Building standards reduce the need for natural gas by making the building envelope more efficient, thus reducing the demand on gas-fired heaters
- Building standards also require certain large gas-fired equipment to be efficient (beyond scope of appliance regulations)



Public Agency and Industrial Programs

- Technical assistance and loans to improve efficiency in public buildings
 - Boiler replacements/retrofits, school heater installations
- Agricultural industry improvements
 - Applied research demonstrating efficient technologies in greenhouses; achieved 25% to 30% reductions in thermal heating
 - Low interest loans for shading curtains, double glass roofing materials and other insulation technologies to reduce natural gas consumption



Savings from Efficiency

- In the year 2000, the savings attributed to efficiency standards and public goods charge programs (in year 2000 and from the residual affect of programs and standards from the previous years) total 2,000 million therms.
- Approximately $\frac{2}{3}$ of total is attributed to efficiency standards and $\frac{1}{3}$ is attributed to publicly-funded programs.



What More Efficiency Can be Done?

- Adopt new appliance standards where possible
 - Many revisions are hampered by federal preemption
- Improve building standards
 - 2005 building standards expected to save 8.8 million therms in first year of construction, double in second year, etc.
 - Additional savings achieved indirectly through reduced electrical demand, 2005 standards to save 180 MW and 475 GWh in first year of construction, double in year two
- Fund programs to encourage going beyond standards and making improvements to existing buildings
- Consider new mandatory trigger points for efficiency
- Educate consumers/customers



Fuel Diversity in Electricity Generation

- Renewable energy is part of an integrated strategy identified in the ***Integrated Energy Policy Report*** to maintain fuel diversity in electricity generation.
- Renewable resources already significantly reduce the demand for gas-fired generation.
 - Estimated 12% of 2003 retail sales from renewables (29,965 GWh/244,139 GWh).



Fuel diversity in Electricity (continued)

- California's RPS (SB 1078) was created to increase statewide renewable generation to 20% of retail sales by 2017, within cost constraints.
 - IOUs increase sales of electricity from renewable energy by at least 1 percent per year achieving 20% by 2017 at the latest.
 - Publicly-owned utilities shall define their own RPS consistent with the intent of the Legislature for the statewide RPS goals.
- The CPUC/CEC/CPA ***Energy Action Plan*** recommends accelerating the RPS to 20% by 2010.



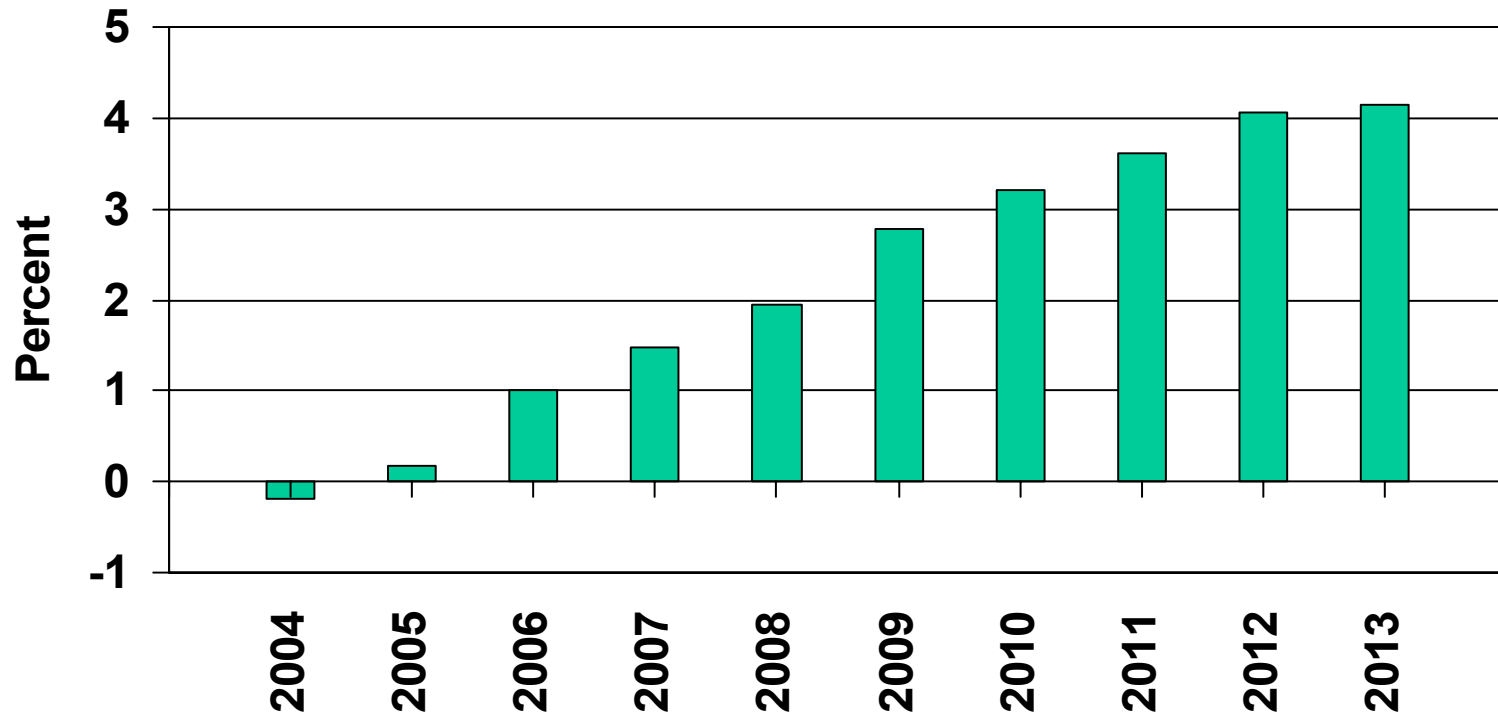
Estimate of Natural Gas Displacement

- CEC simulations suggest that
 - natural gas used to generate electricity in the WECC from 2004-2013 could decrease an average of 2.5% as a result of IOU compliance with the RPS.
 - Under the accelerated RPS the reduction is 4.5%.
- Compliance by the publicly-owned utilities is also expected to displace gas-fired generation.



California Energy Commission

Displacement of natural gas use in WECC (GBTu) due to CA IOU RPS



MarketSym™ Model for IOU RPS (fall 2002 forecast)



Estimated Displacement (continued)

- CEC simulations suggest that
 - 85% of renewable resources added by IOUs from 2004-2013 displace WECC gas-fired electricity.
 - Under the accelerated RPS this changes to 96%.



Benefits of Fuel Diversity

- Currently, 36% of California's electricity is gas-fired. Model results reported in the ***Electricity Infrastructure Assessment*** suggest that without energy efficiency measures or RPS this could increase to 44% by 2013.
- Relative to projected trends, reduced demand for gas-fired electricity in California should
 - put downward pressure on the price for natural gas.
 - reduce the percentage of electricity generation that is affected by natural gas price volatility.
 - reduce greenhouse gas emissions and criteria air pollutants.